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Student Tracking System

Program Notes for BTEC IT Unit 4

Learning Aim A – Code Analysis

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Overview - What is the program?

The program is meant to simulate an student homework tracking system to be used by Teachers. The idea is that student data and their homework grades are contained in a file called StudentData.txt.

Each row of this file contains an individual student and their associated homework and statistics.

The list of students is loaded into the program from which simple data operations are performed.

At the end of each modification operation, the user is given a chance to save the data back to the file.

The program makes extensive use of:

- User Input validation
- Arrays and Structures
- Try Catch Finally blocks
- Do while loops
- For loops
- File Input and Output.

The program code has been especially designed to use only the code techniques covered in the syllabus. It is not meant to represent a definitive information management system, however it will provide enough of a detailed code base for students to analyse for Learning Aim A.

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Getting Started – The Text File

Key information is held in the file InventoryData.txt.

The file contains the following information:

ID, FNAME, SNAME, HW1, HW2, HW3, AVG, GRADE, TARGET, STATUS
1,John,Smith,9,4,8,70.0,B,A,OK
2,Mujahid,Ali,10,4,9,76.7,B,A,OK

Figure 1 – the text file data for the program.

The first row is a header row and identifies the following columns:

- ID – a unique ID for each student
- FNAME – the first name of the student
- SNAME – the last name of the student
- HW1 – the marks for the first homework
- HW2 – the marks for the second homework
- HW3 – the marks for the third homework
- AVG – the average score of all homework as a percentage
- GRADE – the current working at grade of the student based on their average score and a set of predefined grade boundaries
- TARGET – the target grade of the student
- STATUS – a flag for each student. A student with 0 for each homework is classed as NEW, working at or above the target grade is GOOD, one or two levels below the target grade is OK and three or more levels below, or working at a U grade is ALERT.

The items are separated by a ‘,’ to allow the line to be split into a string array.

Note the last item on the list has no ‘,’ after it and this logic must be dealt with in code.

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The Main Menu

On running the program, the Main Menu is displayed:

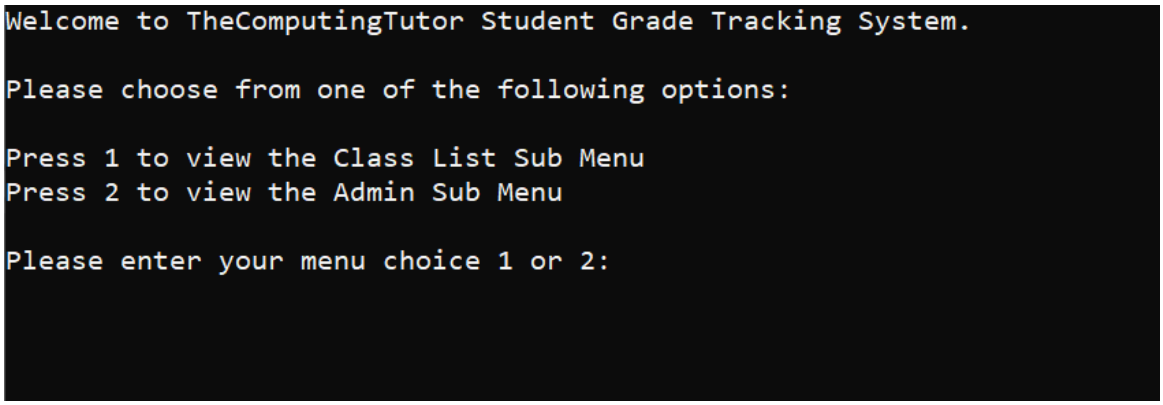
Welcome to TheComputingTutor Student Grade Tracking System.
Please choose from one of the following options:
Press 1 to view the Class List Sub Menu
Press 2 to view the Admin Sub Menu
Please enter your menu choice 1 or 2:

Figure 2 the main menu of the program.

The program then displays the standard error handling.

Any user input must be of the correct datatype (string, int) and must be a valid number.

This is carried out by a combination of SELECT CASE statements to check for validity, a DO WHILE loop to prompt the user to have another go, and a TRY CATCH statement to check for the correct datatypes being entered.

Key Functions	
Function Name	Purpose
`RunProgram()`	The main code to run the program
`LoadStudentData()`	Loads the student data file into a holding array of strings
`BuildClassData()`	Builds an array of student structures from the string array. This array is visible to the entire program.
`DisplayMainMenu()`	Displays the main menu to the user.
`CheckInputIsANumber()`	Checks any user input. If it is not a number the code returns -1
`DisplayClassListSubMenu()`	Displays the class list sub menu
`DisplayAdminSubMenu()`	Displays the admin sub menu

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```
Welcome to TheComputingTutor Student Grade Tracking System.

Please choose from one of the following options:

Press 1 to view the Class List Sub Menu
Press 2 to view the Admin Sub Menu

Please enter your menu choice 1 or 2: 5
This is not a valid input.
Please Try Again:
Please enter your menu choice 1 or 2: fred
This is not a valid input.
Please Try Again:
Please enter your menu choice 1 or 2:
```

Figure 3 – user input validation for the main menu.

If a user enters a string, when the program tries to convert this to a number a FormatException is caught.

When this happens, the catch block sets a variable to -1 and returns this number. If the calling code detects this number, then the user has entered the wrong datatype and the program will prompt the user

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